JAN 17 '33

STATISTICAL BULLETIN
Metropolitan Life Insurance Co.

VOL. XIII DECEMBER, 1932 No. 12

THE OUTLOOK FOR TUBERCULOSIS

From time to time, we have considered, in this BULLETIN, the future trend of tuberculosis in the United States. We have pointed out that the course of the deathrate from this disease, during the last thirty years, would justify the prediction that, by 1937, in the area known as the Original Death Registration States and the District of Columbia, the tuberculosis deathrate will be less than 40 per hundred thousand.

Many will be interested to know what effect the continuance of the business depression and the hard times incidental thereto may have on this prediction. Is there any indication, as yet, that the prognostications made at earlier times must now be modified in the light of a change in trend? It is particularly gratifying to report that a study recently completed in the Statistical Bureau of the Metropolitan Life Insurance Company gives no indication of any slowing up in our progress against the disease. In fact, this year the mortality from tuberculosis has declined among industrial wage earners and their families at a rate actually in excess of the average annual rate of decline for a number of years past. The same situation is appearing in the current reports of health departments of states and cities.

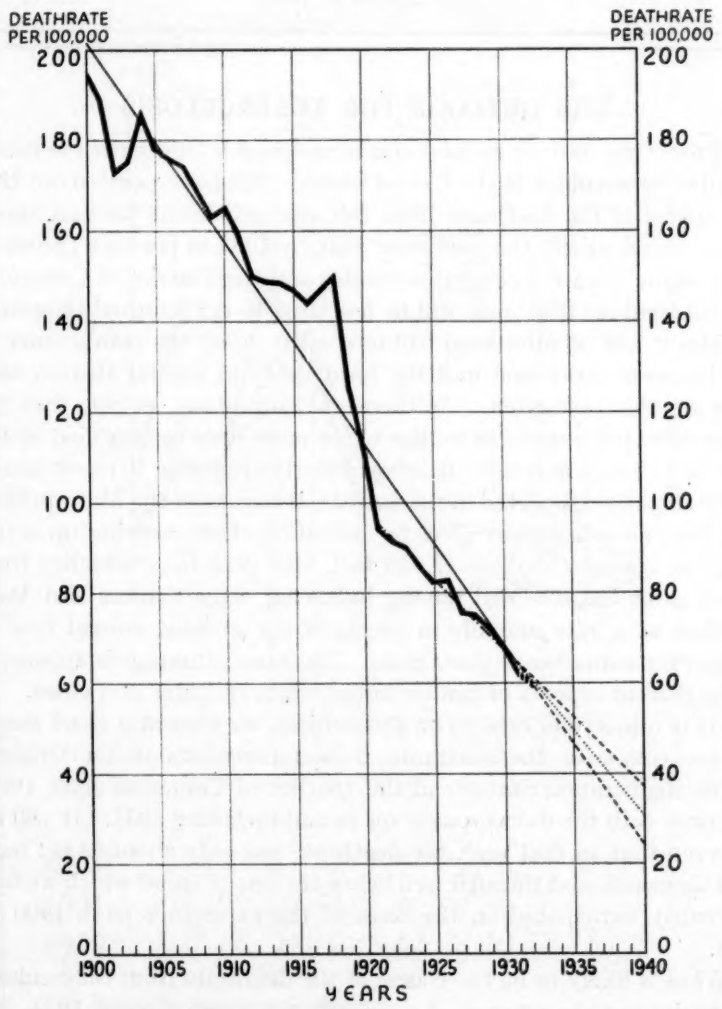
As in our former articles on this subject, we present a chart showing the course of the deathrate from tuberculosis in the Original Death Registration States and the District of Columbia since 1900, this time with the data brought up to and including 1931. It will be observed that, in that year, the deathrate was only about 62 per hundred thousand, and thus fell well below the line of trend which we had previously anticipated on the basis of the experience from 1900 to 1928.

What is likely to be the course of the deathrate from tuberculosis in the immediate future? As regards the current year 1932, for which data for the general population are not yet available, a close range estimate has been made by two separate methods. First, a

TUBERCULOSIS - *ALL FORMS*

Prospective deathrates, 1932 *to* 1940

Original Registration States and District of Columbia



second-degree trend line was put through the observed rates from 1921 to 1931. A second estimate was based on the deathrates among the Industrial policyholders of the Metropolitan Life Insurance Company, and the correlation between these and the corresponding deathrates in the general population. The first of these estimates gave a figure of 59.5 per 100,000 for 1932 and the second 59.4. Thus, we have good warrant for expecting that the general population deathrate from tuberculosis in 1932 will be found to be about 60 per 100,000 or less in the Original Registration States and the District of Columbia.

For a longer range forecast, namely to 1940, estimates have also been made on two different bases. The first computation was made on the simple assumption that the trend defined by the entire series, 1900 to 1931, is indicative of the future course of events. On this assumption it is found that, in 1940, the deathrate from tuberculosis would be 24 per 100,000. If, on the other hand, as a second and more conservative assumption, we continue the trend observed over the more recent period 1921 to 1931, the trend line, at the year 1940, falls on a point corresponding to a deathrate of 37 per 100,000. The mean of these two estimates is a little over 30 per 100,000.

So far as current experience permits us to judge, the present depression has had no retarding effect on the improvement in tuberculosis mortality, and our previous estimates stand virtually unmodified, or, if anything, they may be found to be somewhat too moderate.

THE INCREASING MENACE OF CANCER

In both last month's and this month's issue, we have noted with much satisfaction the great reduction that has occurred in the threat to human life from tuberculosis. Now, since all must die, if the probability of dying from one cause is diminished, it is inevitable that the probability of dying from some other cause or causes must increase. If, therefore, in this series of articles we have to chronicle instances of increasing probability of dying from some of the causes that will be considered, this must be accepted as the price we pay for benefits received in other directions.

The outstanding example of causes of death through which we are paying this price is, unfortunately, cancer. This disease claims its victims, for the most part, in the last quarter of life, and the probability of ultimately dying from cancer increases steadily until about the forty-fifth year of life, the exact location of the maximum varying somewhat according to sex and color. This and certain other fea-

tures of interest are well illustrated in the first of the accompanying graphs. Here we see a plot of the probabilities, at successive ages of life, of ultimately dying from cancer according to mortality conditions in 1920, 1925 and 1930. It is instructive to study these curves in conjunction with the corresponding curves for tuberculosis shown on the same diagram. Several characteristic features are immediately apparent to the eye. The maximum probability of ultimately dying from the disease comes much earlier in life for tuberculosis than for cancer. For white persons, the three curves for the calendar years 1920, 1925 and 1930 appear in this order from above downwards, for tuberculosis; but in reverse order for cancer. For the one disease, there are substantial decreases in the last ten years; for the other, increases.

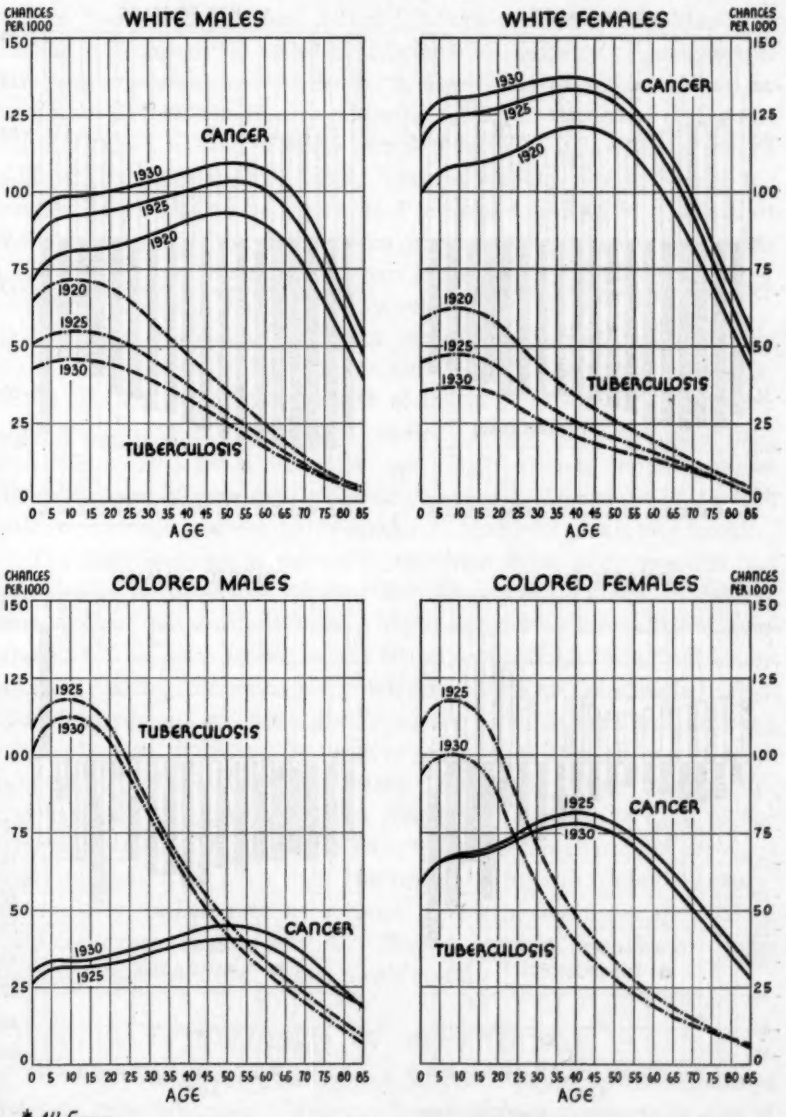
The situation is a little different for the colored female population. Here the probability of dying from cancer has diminished slightly at all ages 15 years and over in the interval from 1925 to 1930. This somewhat surprising result is due to the shift of the bulk of deaths to later ages, in greater degree for all causes combined than for cancer.

The general aspect of the chart for colored persons is also very different from that for the white population, in that the curves for tuberculosis and for cancer cross, namely, at about age 50 in the case of males, and about age 25 in the case of females. This means that, at the earlier ages, the probability of eventually dying from tuberculosis is greater than that of dying from cancer, while, at the later ages, this condition is reversed. This reversal, which does not occur in the white population, is due to the very high mortality from tuberculosis at the younger ages among colored persons.

Very instructive also is the second graph, which exhibits the per cent. increase in the probability of eventually dying from cancer at successive ages, according to mortality conditions in 1930, as compared with those in 1920 for white persons, and in 1925 for colored persons, contrasted with the corresponding figures for tuberculosis. For white persons, the graph for cancer is all on one side (above) the central base line, and that for tuberculosis is entirely below that base line. For the colored females, the graphs are both below the base line through almost the entire range of life, indicating that at nearly all ages the chances for these women of eventually dying from cancer has slightly decreased in the last five years.

CHANCES OF EVENTUALLY DYING FROM TUBERCULOSIS* AND FROM CANCER* By Color, Sex, and Age

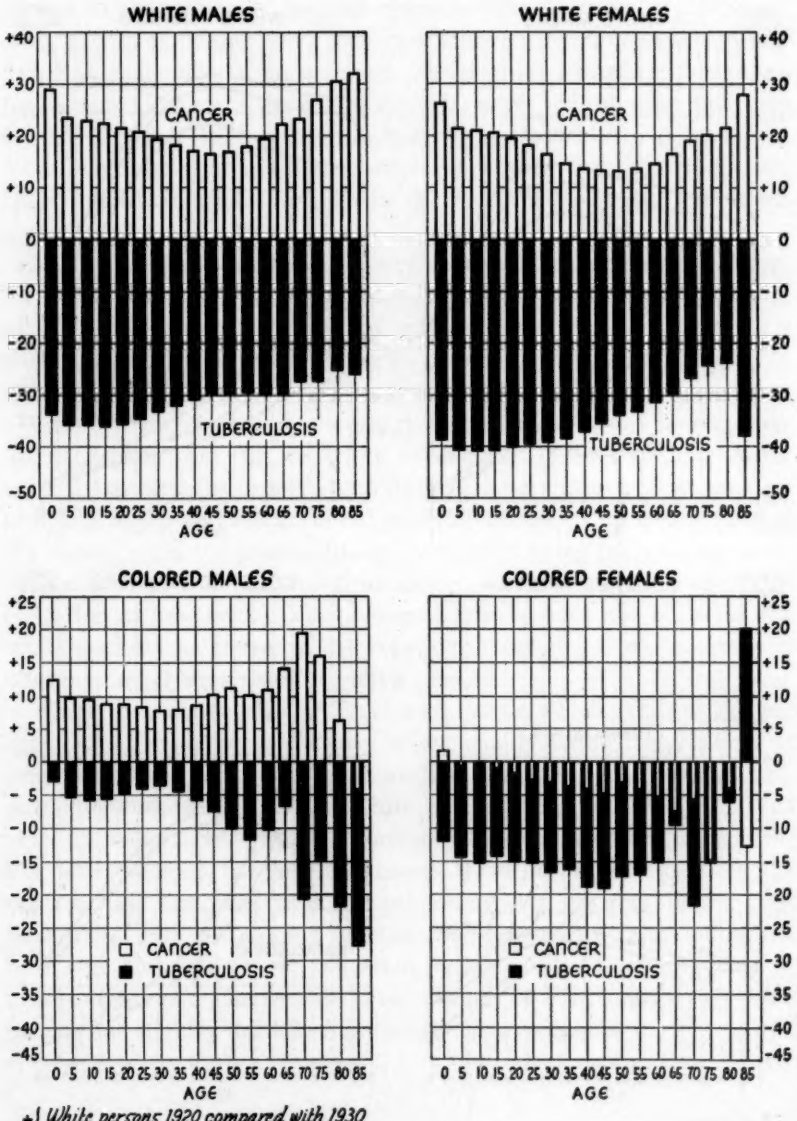
UNITED STATES† 1920, 1925 & 1930



* *All forms*

† *Data relate to Death Registration States as of 1920*

PER CENT CHANGES* IN PROBABILITY OF EVENTUALLY DYING FROM TUBERCULOSIS AND FROM CANCER



*{ *White persons 1920 compared with 1930*
Colored persons 1925 compared with 1930

FORTY PER CENT. INCREASE IN EXPECTATION OF LIFE IN FORTY YEARS

Since 1890, the average length of life or, as it is more scientifically called, expectation of life at birth, has increased by a little over forty per cent., or by about seventeen years. This announcement was made by Drs. Louis I. Dublin and Alfred J. Lotka, of the Metropolitan Life Insurance Company, in an address before the AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, assembled at Atlantic City on December 27th. The figures relate primarily to the State of Massachusetts, which has particularly complete records. The average length of life in that state in 1890 was 42.5 years for males and 44.5 years for females. By 1930, these figures had increased to 59.5 for males and 62.7 for females, thus showing an increase of seventeen years for males and a little over eighteen years for females. This is an amazing record for the short period of forty years.

It is only since 1901 that data covering a larger area have been available for purposes of comparison. For the ten Original Registration States, the average length of life in 1901 was 48.2 years for white males and 51.1 for white females. By 1930, these figures had increased to 59.1 for white males and 62.6 for white females, showing an increase of very nearly eleven years, or 22.5 per cent., for white males and eleven and one-half years, or 22.6 per cent., for white females.

The improvement in mortality to which these gains are due has been chiefly in the earlier years of life. Among white males, in the last decade, there has actually been a slight setback in mortality at ages fifty and over; and among white females, although no actual losses are here shown, the gains are relatively slight at these higher ages. The improvement has been due to advances in medical and sanitary science, which, however, have very unequally affected our success in the fight against different diseases. The result of this unequal success has been to cause a marked change in the relative rank of the principal causes of death, as we have had occasion to note in previous issues of this BULLETIN. At the beginning of the present century, tuberculosis ranked first as a cause of death, heart disease ranked third and cancer ranked seventh. Today, organic heart disease ranks first, cancer second and tuberculosis sixth.

INFLUENZA IN 1932 AND 1933

In recent weeks there has been a distinct increase in the amount of sickness from influenza. Reports from eighteen states show almost three times as many cases in November as in October. Furthermore,

for a five weeks period ended December 17th, the weekly reports of the UNITED STATES PUBLIC HEALTH SERVICE show more than fifteen times the number reported for the corresponding weeks of 1931.

The most outstanding increases during these five weeks, as compared with the corresponding weeks of last year, are in California, New Mexico, Arizona, Colorado, Louisiana, Alabama, South Carolina, Georgia, Mississippi, Arkansas and Tennessee. In other states, the number of cases reported is smaller, but almost all show more or less marked increases over last year, and, in nearly all, there have been sharp rises in recent weeks in the number reported.

As to mortality during these recent weeks, the only reliable evidence is that afforded by the reports on the policyholders of the Metropolitan Life Insurance Company, which show that the mortality from this disease for the fourth week of December was five times that for the fourth week of November.

Since 1920, periodicity, or at least approximate periodicity, has been a striking characteristic of influenza epidemics. Attention was directed to this in the STATISTICAL BULLETIN of November, 1930. It was pointed out that 1920 was an exceptionally bad influenza year; and that in 1923, 1926 and 1929, peaks in the influenza deathrate curve were in evidence. If this three-year cycle had continued, with exactitude, another peak in the mortality rate would have been in evidence for the year 1932. Influenza, in epidemic form, did not, however, make its appearance in 1932 until early November; and it is extremely improbable that a sufficient number of fatal cases will be recorded to account for another peak deathrate, especially in view of the very low influenza rate which prevailed during the first ten months of 1932. It is entirely possible, nevertheless, that a peak will be registered for 1933—especially if the influenza mortality continues to increase, after the turn of the year, at the rate observed during the closing weeks of 1932. Up to the present time, fortunately, there are no indications that the influenza cases now prevailing are of the virulent type which characterized the major outbreaks of 1918 and 1920.

HEALTH RECORD FOR NOVEMBER, 1932

While it will not be possible to compute the exact deathrate for 1932, among the millions of Industrial policyholders of the Metropolitan Life Insurance Company, until after the close of the year, it can now be announced, safely, that this year's figure will be lower than for any previous one. The cumulative mortality rate for eleven months of 1932 denotes an improvement of 2.5 per cent., as

compared with the like period of last year. Among these insured persons living in the Pacific Coast and Mountain States, the year-to-date deathrate is .7 per cent. below last year's figure; in the rest of the United States, the drop is 2.7 per cent., and among insured Canadians, 4.0 per cent.

For the month of November, the deathrate increased considerably, as compared with that for the preceding month and with the figure recorded for November, 1931.

With respect to some of the more important causes of death, the developments of the current year have been so clear-cut that it was possible to announce, months before the year's close, that new minimal deathrates would be recorded for at least five causes of death, namely tuberculosis, pneumonia, diarrhea and enteritis, conditions arising out of pregnancy and childbirth, and accidents. To this list we may now add, with certainty, typhoid fever, measles and diphtheria. It is interesting to note that all of these eight conditions are in the controllable class.

As announced in a previous BULLETIN, there are three diseases—cancer, diabetes and heart disease—which will be charged this year with more deaths than ever before. Cancer, for the eleven months period, January to November, 1932, shows a rise of 9.8 per cent. in its deathrate since last year; for heart disease and diabetes, the increases are 5.3 per cent. and 10.2 per cent. respectively. The heart disease mortality record has been particularly unfavorable during the latter half of the year. During the first quarter, the rate ran well below that for the like part of 1931; but for eight successive months, increases over last year's mortality rates have been observed.

The deathrate in the general population of the large cities of the United States during November was 10.7 per thousand estimated population, as compared with 10.2 in October and 10.9 in November, 1931. Measles, scarlet fever, smallpox and influenza were the diseases which increased in prevalence in November, as compared with October; those which decreased were diphtheria, poliomyelitis and typhoid fever. Comparison with November, 1931, shows that there was more sickness in 1932 from influenza, measles and scarlet fever, together with fewer cases of diphtheria, poliomyelitis, smallpox and typhoid fever.

Reports of influenza from 18 states show almost three times as many cases in November as in October. The increase was confined, almost entirely to certain Southern states and to California. The out-

standing increases were in Alabama, Louisiana, Tennessee, South Carolina and California.

Measles cases, according to reports from 19 states, almost doubled in November. For this disease, the increase was largely confined to the Middle Atlantic and East North Central states. Scarlet fever was also more prevalent in November, with reports from 45 states showing cases to have increased from 12,003 to 15,413. The northeastern section of the country was most affected.

There was a considerable increase in smallpox in November, 348 cases being reported from 46 states, as compared with 150 in October. In Ohio, cases increased from 28 in October to 112 in November.

Among the outstanding public health activities reported during the month are the following: After five years of research into the question of making adequate medical care available to all, the COMMITTEE ON THE COSTS OF MEDICAL CARE made its final report. A group of students in the UNIVERSITY OF MISSOURI have formed a health unit to aid state and national tuberculosis organizations in their fight against this disease. This is the first organization of its kind arising out of the voluntary action of the students themselves at any university.

The following table shows the mortality among Industrial policyholders for November, 1932; October, 1932 and November, 1931, together with the cumulative rates for the first eleven months of each year.

METROPOLITAN LIFE INSURANCE COMPANY

Deathrates* per 100,000 for Principal Causes Premium-Paying Business in Industrial Department (Annual Basis)

MONTHS OF NOVEMBER, 1932; OCTOBER, 1932 AND NOVEMBER, 1931

CAUSES OF DEATH	ANNUAL RATE PER 100,000 LIVES EXPOSED*				
	Nov. 1932	Oct. 1932	Nov. 1931	Cumulative January to November	
				1932	1931
TOTAL—ALL CAUSES	823.6	753.7	773.3	856.3	878.3
Typhoid fever	2.2	3.0	2.2	1.7	2.2
Measles	.4	.2	.6	1.8	3.2
Scarlet fever	2.1	1.7	2.0	2.8	3.1
Whooping cough	1.6	1.4	2.9	3.1	3.6
Diphtheria	4.3	3.7	7.6	3.8	4.3
Influenza	9.7	7.1	8.1	17.3	21.2
Tuberculosis (All forms)	64.5	57.4	67.0	70.4	76.3
Tuberculosis of resp'y system	57.0	51.4	59.4	62.2	67.4
Cancer	96.4	86.1	83.8	90.7	82.6
Diabetes mellitus	24.3	21.4	20.5	22.7	20.6
Cerebral hemorrhage	64.7	57.5	54.7	62.5	60.7
Organic diseases of heart	146.8	145.2	131.3	155.3	147.5
Pneumonia (All forms)	56.0	40.5	56.4	63.8	74.9
Other respiratory diseases	10.5	7.8	8.4	9.3	10.4
Diarrhea and enteritis	9.5	14.4	12.3	11.7	16.1
Bright's disease (Chronic nephritis)	67.0	60.8	65.3	68.0	66.4
Puerperal state	8.9	7.7	8.8	10.6	11.1
Suicides	8.5	10.8	8.0	10.8	9.7
Homicides	6.7	6.1	5.6	6.2	6.9
Other external causes (excluding suicides and homicides)	51.6	48.2	56.3	55.2	60.9
Traumatism by automobiles	20.5	19.1	23.0	19.0	21.7
All other causes	188.1	172.6	171.4	188.7	196.9

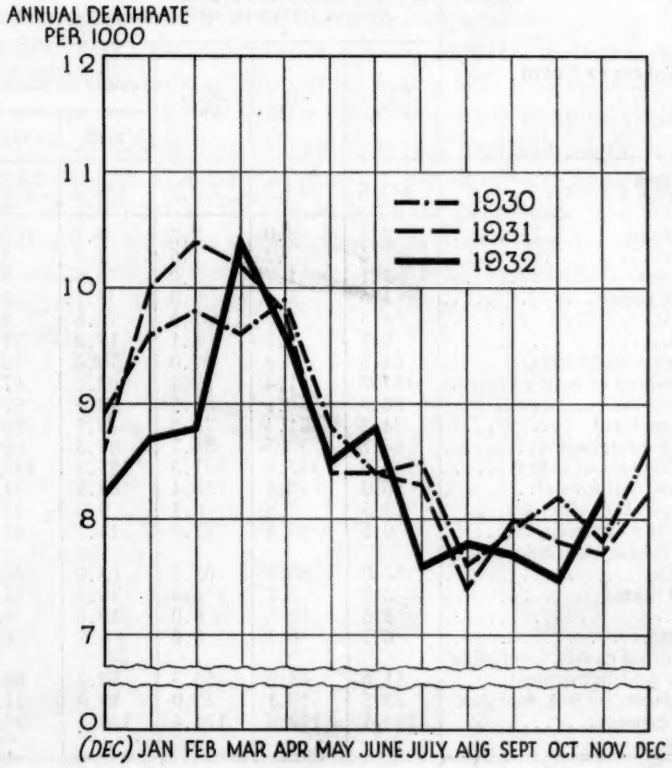
*All figures in this table include insured infants under one year of age. The rates for 1932 are subject to slight correction, since they are based on provisional estimates of lives exposed to risk.

Correspondence on the subjects discussed in these BULLETINS may be addressed to: The Editor,

STATISTICAL BULLETIN,
Metropolitan Life Insurance Company,
1 Madison Avenue, New York City

DEATHRATES
FROM ALL CAUSES

METROPOLITAN LIFE INSURANCE CO.
INDUSTRIAL DEPARTMENT



1930	9.6	9.8	9.6	9.9	8.8	8.4	8.5	7.6	7.9	8.2	7.8	8.6
1931	10.0	10.4	10.2	9.8	8.4	8.4	8.3	7.4	8.0	7.8	7.7	8.2
1932*	8.7	8.8	10.4	9.6	8.5	8.8	7.6	7.8	7.7	7.5	8.2	

* *Rates for 1932 are provisional*

METROPOLITAN LIFE INSURANCE COMPANY PRESS
NEW YORK, U.S.A.
78176

SUPPLEMENT TO VOLUME XIII

Metropolitan Life Insurance Company. Statistical Bulletin.

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M. L. I. CO. PRESS—78178—PRINTED IN U.S.A.